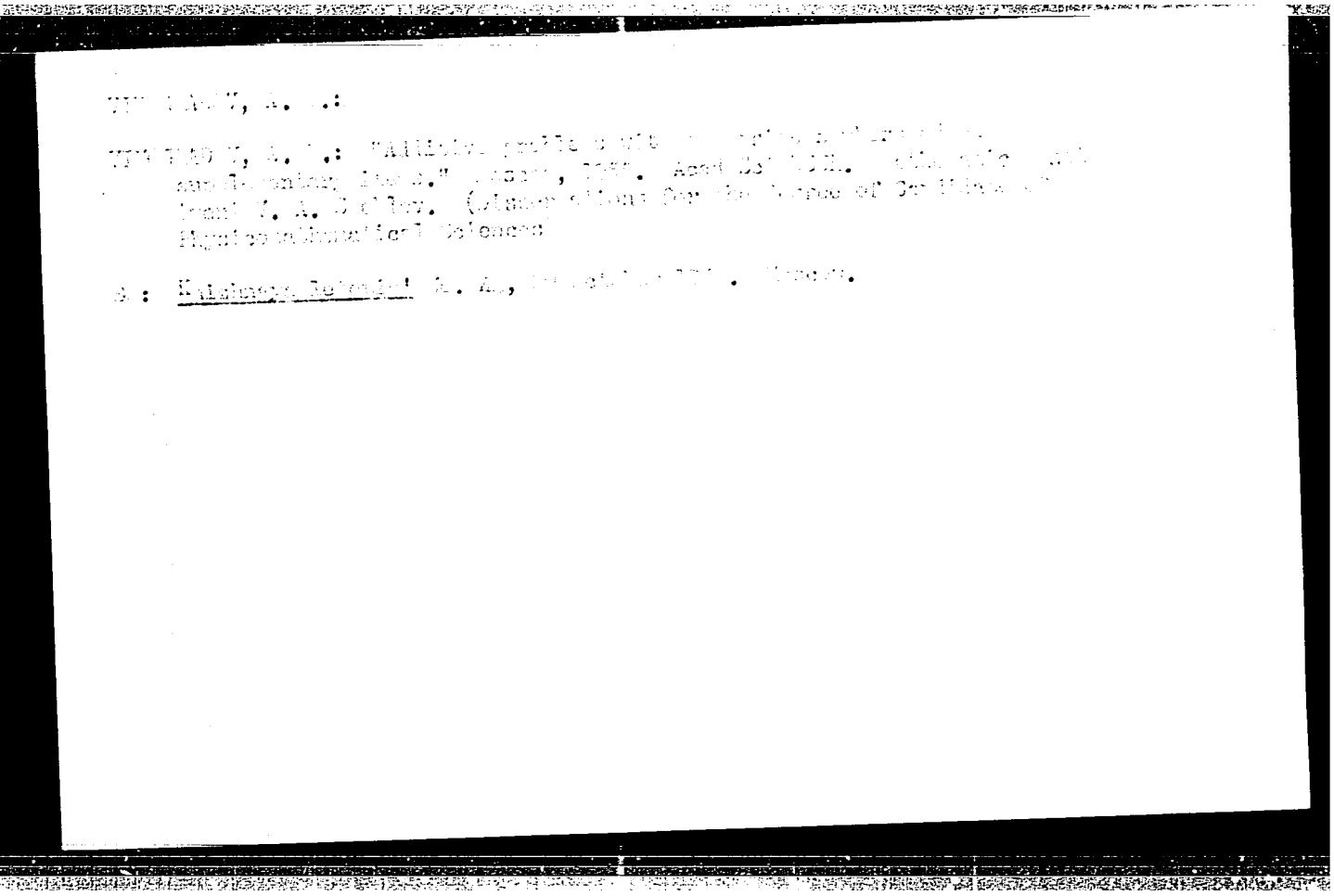
VINOGRADOV, A.I.

Generalization of Klostermann's formula. Dokl. AN SSSR 146 no.4:754-756 O '62. (MIRA 15:11)

1. Leningradskoye otdeleniye Matematicheskogo instituta im. V.A. Steklova AN SSSR. Predstavleno akademikom I.M. Vinogradovym.

(Numbers, Prime)



VINOGRADOV, A.I. (Leningrad)

The sieve method in algebraic fields. Mat. sbor. 64 no.1: 52-78 My '64. (MIRA 17:6)

VINOGRADOV, A. I.

USSR/Mathematics - Theory of numbers

Card 1/1 Pub. 22 - 5/54

Authors : Vinogradov, A. I.

Title : On new theorems of the additive theory of numbers

Periodical : Dok. AN SSSR 102/5, 875-876, June 11, 1955

Abstract : Theorems dealing with the addition of two prime numbers with "rare sequences" are proved. The proof was accomplished in view of theorems on zeros L(S,X) by Dirichlet, Linnik and others and the theorems on evaluations of the trigonometric sums by Vinogradov. One USSR reference (1953)

Institution : The Acad. of Sc., USSR, V. A. Steklov Institute of Mathematical Sciences

Presented by: Academician I. M. Vinogradov, March 4, 1955

Vinogradov, A.I.

Call Nr: AF 1108825

Transactions of the Third All-union Mathematical Congress (Cont.) Moscow, Jun-Jul '56, Trudy '56, V. 1, Sect. Rpts., Izdatel'stvo AN SSSR, Moscow, 1956 237 pp.

Vinogradov, A. I. (Leningrad). New Additive Problems with primes. 4

Dem'yanov, B. V. (Moscow). On Hypothesis Concerning the Expression of Zero by Forms With p - adic coefficients. 4-5

There are 2 references, both USSR.

Kogoniya, P. G. (Tbilisi). On the Set of Condensation Points of Markov's Number Set. 5

There are 2 references, 1 USSR and 1 German.

Kubilyus, I. P. (Vil'nyus). On Distribution Values of Theoretical Number Functions. 5-6

Mention is made of Kolmogorov, A. N.

Levin, B. V. (Tashkent). On a Special Class of Differential Operators Which is Connected With the Theory of Modular Functions and the Theory of Numbers. 6

Card 3/80

VINOGRADOV, A.I.

Sieve-method correlations with the Rieman's-function. Vest. Len. un. 11 no.13:142-146 '56. (MLRA 9:10)

(Functions, Zeta) (Aggregates)

SUBJECT USSR/MATHEMATICS/Number theory CARD 1/2 PG - 579
AUTHOR VINOGRADOV A.I.
TITLE On an "almost binary" problem.
PERIODICAL Izvestija Akad.Nauk 20, 713-750 (1956)
reviewed 2/1957

The author proves some additive theorems on prime numbers which, in a certain sense, form an approximation to the binary problem of Goldbach. The principal result of the present paper is contained in the following theorem: For all $N > N_0$ a k_0 can be determined such that every $N > N_0$ can be represented in the form

$$N = p_1 + p_2 + E_{x_1} p^{x_1} + E_{x_2} p^{x_2} + \ldots + E_{x_k} p^{x_k} .$$

Here p_1 and p_2 are prime numbers, $x_i \leq M$, $k \leq k_0$, $x_1 \neq x_2, \ldots, x_k$ all different from eachother. The numbers N and p·k are both either even or odd. Therefrom follows: If a sufficiently large number N is written in the form

$$N = a_0 + a_1 p + \ldots + a_R p^R$$

and if the sum of two prime numbers is wanted, then it is sufficient to change by ± 1 a number of coefficients bounded by an absolute constant, where the zeros are replaced by +1 and the number p-1 is replaced by -1.

Izvestija Akad. Nauk 20, 713-750 (1956) CARD 2/2 PG - 579

The proof is given according to the method of Linnik (Mat. Sbornik, n. Ser. 32, 3-60 (1953)).
An improved assertion can be obtained under the assumption of the extended Riemannian conjecture.

INSTITUTION: Math. Inst. Acad. Sci. USSR

SUBJECT USSR/MATHEMATICS/Number theory
AUTHOR VINOGRADOV A.I.
TITLE On numbers with small prime divisors.
PERIODICAL Doklady Akad. Nauk 109, 683-686 (1956)
reviewed 10/1956

In extension of the well-known results on numbers the prime divisors of which have an upper bound, the author proves the following theorems:

I. Let $F(x,z,q)$ be the number of integers $\leq x$ which are relatively prime with $q \leq x$ and the prime divisors of which are $\leq z$.

a) if $\ln x \leq z \leq x^{1/\theta}$, then

$$F(x,z,q) < c_1 x \prod_{p|q} \left(1-\frac{1}{p}\right) \exp\left[-\frac{1}{\alpha}\left(\ln \alpha^{-1} + \ln\ln \alpha^{-1}\right) + \frac{1}{\alpha} + \frac{\theta}{\alpha \ln \alpha^{-1}}\right]$$

where $\alpha = \frac{\ln z}{\ln x}$; c_1 an absolute constant; $\theta < 2$;

b) if $z < \ln x$, then $F(x,z,q) = O(e^{\pi(z)} \ln x)$

c) if $x^{1/e} \leq z \leq x$, then $F(x,z,q) = O\left(x \prod_{p|q}\left(1-\frac{1}{p}\right)\right)$.

II. Let $\lambda \frac{(\ln\ln x)^{7/4}}{\sqrt[4]{\ln x}} \leq \alpha \leq \frac{1}{e}$, λ an absolute constant, then:

Doklady Akad. Nauk 109, 683-686 (1956) CARD 2/2 PG - 338

$$F(x,z)(=F(x,z,1)) = \omega(\alpha)e^{c}x\,\exp\left[-\frac{1}{\alpha}\left(\ln\frac{1}{\alpha}+\ln\ln\frac{1}{\alpha}\right)+O\left(e^{c}x\,\exp\left[-\frac{1}{\alpha}\left(\ln\frac{1}{\alpha}+\ln\ln\frac{1}{\alpha}\right)\right]\frac{1}{\ln x}\right)\right.$$

where

$$\omega(\alpha) = \frac{1}{2\pi}\int_{-1}^{+1}\frac{x^{it}e^{\psi(t)}}{(1-\gamma+it)(\gamma-it)}dt = O(\alpha), \quad \gamma = \frac{1}{\ln z}\left(\ln\frac{1}{\alpha}+\ln\ln\frac{1}{\alpha}\right),$$

$$\psi(t)=u(\gamma,t\ln z)-iv(\gamma,t\ln z), \quad u(\gamma,t\ln z)= e^{\gamma\ln z}\int_{0}^{t\ln z}\frac{x\cos x-\gamma\ln z\sin x}{(\gamma\ln z)^2+x^2}\,dx,$$

$$v(\gamma,t\ln z) = e^{\gamma\ln z}\int_{0}^{t\ln z}\frac{x\sin x+\gamma\ln z\cos x}{(\gamma\ln z)^2+x^2}\,dx,$$

$$e^{c} = \frac{\gamma+\xi\gamma^2+O(\gamma^3)}{\prod_{p<z}\left(1-\frac{1}{p^{1-\gamma}}\right)} = e^{\frac{1}{\alpha}+\frac{\theta}{\alpha\ln 1/\alpha}}, \quad \xi \text{ - Euler's constant.}$$

The proof bases on the consideration of the distribution of zeros of the Riemannian ζ-function.

INSTITUTION: Leningrad Dept. Section of the Mathematical Institute, Leningrad, of the Acad.Sci. USSR.

VINOGRADOV, A.I.; LINNIK, Yu.B.

Evaluating the sum of numbers of divisors in a short section of an arithmetical progression. Usp.mat.nauk 12 no.4:277-280 Jl-Ag '57. (MIRA 10:10)
(Series)

SUBJECT USSR/MATHEMATICS/Number theory CARD 1/2 PG - 726
AUTHOR VINOGRADOV A.I.
TITLE The application of $\zeta(s)$ to the sieve of Eratóstenes.
PERIODICAL Mat.Sbornik,n.Ser. 41, 49-80 (1957)
reviewed 5/1957

Let be given the aequence of integers (A): $a_1, a_2, a_3, \ldots, a_N$, the sequence of prime numbers (B): $p_1, p_2, \ldots, p_r$ and the system of remainders $b(p_i,1), b(p_i,2), \ldots, b(p_i,k_{p_i})$, $1 \leq i \leq r$ for every prime number p_i, The upper and lower estimation of the number of those numbers of (A) which are different from all numbers

$$\lambda_{p_i} + b(p_i, l_{p_i}), \qquad 1 \leq l_{p_i} \leq k_{p_i} \qquad 1 \leq i \leq r,$$

are obtained by a generalization of an idea of Selberg; that permits the application of the method of integro-difference equations due to A.A. Buchstab. Some new lemmas of the theory of ζ-functions are proved. Using this base, among others, the following theorems can be proved:
1. Every sufficiently large pair number can be represented as the sum of two summands each of which contains not more than three prime factors.

2. There exist infinitely many pairs of numbers Q, Q+2, where each of the two numbers contains not more than three prime factors.

INSTITUTION: Leningrad.

SUBJECT USSR/MATHEMATICS/Number theory CARD 1/1 PG - 955
AUTHOR VINOGRADOV A.I.
TITLE Letter to the editor.
PERIODICAL Mat.Sbornik,n.Ser. 41, 415-416 (1957)
reviewed 7/1957

The letter contains the correction of the value of a constant in the author's paper published in Mat.Sbornik, 41, 49-80 (1957) and the changes in the proof of a theorem which are caused by this correction.

AUTHOR: Vinogradov, A.; Corresponding Member, Academy of Sciences, USSR, Delaunay, B. and Fux, D.. 20-118-5-3/59

TITLE: On Rational Approximations of Irrational Numbers With Bounded Partial Quotients (O rational'nykh priblizheniyakh k irratsional'nym chislam s ogranichennymi nepolnymi chastnymi)

PERIODICAL: Doklady Akademii Nauk,1958,Vol 118,Nr 5 pp 862-865 (USSR)

ABSTRACT: Let $\{L\}$ denote a Lagrange class of irrationalities, i.e. a set of irrationalities the decompositions into continued fractions of which are identical from a certain index. Let $\{M\}$ be the Markov limit classes [Ref 1] of the indefinite dual quadratic forms. Let λ_M denote the surface area of the fundamental parallelogram of a two-dimensional Markov limit lattice. The authors consider the connection between the classes $\{L\}$ and $\{M\}$ and the so-called Markov spectrum, i.e. the set of the numbers λ_M. It is stated that this spectrum is complete at least from $5 + \sqrt{2}$ on, i.e. it represents a ray, This fact is obtained from a theorem of M. Hall jun. [Ref 4] concerning the

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On Rational Approximations of Irrational Numbers With Bounded Partial Quotients

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sums of two continued fractions with partial quotients which are smaller than 4 . Unfortunately in the theorem some lines of the paper have been omitted, whereby important consequences on the relations of the classes $\{L\}$ and $\{M\}$ are missing. There are 2 figures and 5 references, 3 of which are Soviet.

SUBMITTED: September 7, 1957

Card 2/2

16(1)
AUTHOR: Vinogradov,A.I. SOV/43-59-7-3/17

TITLE: On Estimations for Binary Problems (Ob otsenkakh dlya binarnykh zadach)

PERIODICAL: Vestnik Leningradskogo universiteta, Seriya matematiki, mekhaniki i astronomii, 1959, Nr 7(2), pp 26-31 (USSR)

ABSTRACT: Let N be a pair number; $N(\alpha)$ be the number of representations N by sums of two numbers both having prime divisors $> N^{\alpha}$. It is $N(\alpha) = N - \sum_{p \leq N^{\alpha}} G(p,N)$, where $G(p,N)$ denotes the number of those numbers in the sequence $\alpha_n = n(N-n)$ which are divisible by p and divisible by no prime number $< p$. Putting for $G(p,N)$ the upper estimations obtained according to the method of A.Selberg, then there follows

$$N(\alpha) \geq T(\alpha) = N - \sum_{p \leq N^{\alpha}} \frac{N}{f(p) \sum_{\nu p \leq z p} \frac{u^2(\nu p)}{f_1(\nu p)}} .$$

The calculations show that $T(\alpha)$ changes the sign in the point $\alpha = \theta \approx \frac{1}{4.4}$ and that $N(\alpha) > 0$ for $\alpha < \theta$. It is shown that this

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On Estimations for Binary Problems SOV/43-59-7-3/17

zero of $T(\alpha)$ can be displaced towards the right hand side, i.e. that a funotion $T_1(\alpha)$ can be constructed for which $N(\alpha) \geq T_1(\alpha) \geq T(\alpha)$ and the zero of $T_1(\alpha)$ lies in $\alpha = \theta+\Delta$, $\Delta>0$.

Some further similar assertions relating partly to the functions $\Lambda_2(\frac{1}{\alpha})$ of A.A.Bukhshtab [Ref 2] are given. An arithmetically evaluable improvement of the well-known estimations is not reached.

There are 2 Soviet references.

SUBMITTED: October 10, 1957

Card 2/2

16(1) SOV/43-59-19-6/14

AUTHOR: Vinogradov, A.I.

TITLE: On an Estimation of Quadratic Forms Used in Arithmetic

PERIODICAL: Vestnik Leningradskogo universiteta, Seriya matematiki, mekhaniki i astronomii, 1959, Nr 19(4), pp 60-63 (USSR)

ABSTRACT: Let $P,A,B,C,D = B^2 + 4AC$ be integers, where exists a number N and a constant $\alpha > 0$ for which $|D| < N$ and $P > N^{\alpha}$. Let $D = D_1 D_2^2$, where D_1 is free of squares; for an integral y let

$$\sigma(y) = \prod_{P/y} (1 + \frac{2^{10}}{\sqrt{P}}).$$

Theorem: It holds

$$\sum_{x=1}^{P} \tau^4(C + Bx - Ax^2) \ll \sigma(D_2) \cdot P(\ln P)^{2^8},$$

where $\tau(y)$ is the number of divisors of y and the constant of the right hand side depends only on α.

The author mentions A.I.Vinogradov, and Yu V.Linnik.

SUBMITTED: November 10, 1958

Card 1/1

BARBAN, M.B.; VINOGRADOV, A.I.

Number-theoretical basis of the probability theory of numbers.
Dokl. AN SSSR 154 no. 3:495-496 Ja '64. (MIRA 17:5)

1. Institut matematiki im. V.I.Romanovskogo AN UzbSSSR i Leningradskoye otdeleniye Matematicheskogo instituta im. V.A.Steklova AN SSSR. Predstavleno akademikom I.M.Vinogradovym.

89965

S/043/60/019/004/015/015XX
D221/D306

16.1000
AUTHOR: Vinogradov, A.I.

TITLE: Generalization of Erdesh's lemma

PERIODICAL: Vestnik Leningradskogo universiteta, Seriya matematiki, mekhaniki i astronomii, v. 4, no. 19, 1960, 124-126

TEXT: The author derives an upper estimate for the number of solutions of the equation $n = d \cdot Q_1 + r \cdot Q_2$, where d and r are two integers, and $(d, r) = 1$ and $d \cdot r \leqslant 0.1 \cdot n$. Also Q_1 and Q_2 are simple divisors greater than n^{α}. With the assumption that

$$S = \sum_{\substack{n=d\cdot Q_1+r\cdot Q_2 \\ (d,\,r)=1,(d,\,n)=1,(r,\,n)=1}} 1.$$

the following lemma holds: Lemma: Under the condition written

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Generalization of Erdesh's lemma

above, the following estimation is true:

$$S < c \cdot \frac{n}{r \cdot d}\left(\frac{1}{\ln^2 \frac{n}{rd}} + \frac{1}{(\ln n)^2}\right) \cdot \ln \ln^2 n \cdot \ln \ln^2 \frac{n}{rd}.$$

Proof: Utilizing the method of A. Sel'berg we obtain (1)

$$S < \sum_{n=d\cdot m_1+r\cdot m_2} \left(\sum_{\substack{v_1 \mid m_1,\\ v_1 < z,\\ (v_1,\, n\cdot r)=1}} \lambda_{v_1}\right)^2 \left(\sum_{\substack{v_2 \mid m_2,\\ v_2 < z,\\ (v_2,\, n\cdot d)=1}} \lambda_{v_2}\right)^2 =$$

$$= \sum_{\substack{v_1 < z^2\\ (v_1,\, v_2)=1}} \sum_{\substack{v_2 < z^2\\ (v_1,\, v_2)=1}} \rho_{v_1} \cdot \rho_{v_2} \sum_{n=d\cdot v_1 m_1' + r\cdot v_2 \cdot m_2'} 1, \qquad (1)$$

$$\rho_v = \sum_{v = \frac{v_1 \cdot v_2}{k},\ k=(v_1,\, v_2)} \lambda_{v_1} \cdot \lambda_{v_2}, \quad m_1' < \frac{n}{d\cdot v_1}, \quad m_2' < \frac{n}{r\cdot v_2},$$

but (HO)

$$\sum_{n=d\cdot v_1\cdot m_1' + r\cdot v_2 \cdot m_2'} 1 = \sum_{m_1' d v_1 \equiv -n \pmod{r v_2}} 1 = \frac{n}{d\cdot r\cdot v_1 v_2} + O(1),$$

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Generalization of Erdesh's lemma

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as all parameters of this equation are simple, consequently (2)

$$S < \frac{n}{d \cdot r} \sum_{\substack{\nu_1 < x^1 \\ (\nu_1, \nu_2)=1}} \sum_{\substack{\nu_2 < x^1 \\ (\nu_1, \nu_2)=1}} \frac{\rho_{\nu_1}}{\nu_1} \cdot \frac{\rho_{\nu_2}}{\nu_2} + \sum_{\nu_1 < x^1} \sum_{\nu_2 < x^1} |\rho_{\nu_1}| |\rho_{\nu_2}|. \qquad (2)$$

The choice of the numbers ν depends on us, therefore we shall select them so that they have simple multipliers only from the interval $(x_0, n^{\alpha}) \cdot x_0$ and z as long as we have arbitrary constants which will be determined later. In such a case (3)

$$\sum_{\substack{\nu_1 < x^1, \nu_2 < x^1 \\ (\nu_1, \nu_2)=1}} \sum \frac{\rho_{\nu_1}}{\nu_1} \cdot \frac{\rho_{\nu_2}}{\nu_2} = \sum_{\nu_1 < x^1} \sum_{\nu_2 < x^1} \frac{\rho_{\nu_1}}{\nu_1} \cdot \frac{\rho_{\nu_2}}{\nu_2} - \sum_{k > x_0} \sum_{\substack{\nu_1 < x^1 \\ (\nu_1, \nu_2)=k}} \sum_{\nu_2 < x^1} \frac{\rho_{\nu_1}}{\nu_1} \cdot \frac{\rho_{\nu_2}}{\nu_2} =$$

$$- \sum_{\nu_1 < x^1} \frac{\rho_{\nu_1}}{\nu_1} \sum_{\nu_2 < x^1} \frac{\rho_{\nu_2}}{\nu_2} + O\left(\sum_{k > x_0} \frac{1}{k^2} \sum_{\nu_1' < \frac{x^1}{k}} \sum_{\nu_2' < \frac{x^1}{k}} \frac{|\rho_{\nu_1'}| \cdot k}{\nu_1'} \frac{|\rho_{\nu_2'}| \cdot k}{\nu_2'} \right). \qquad (3)$$

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Generalization of Erdesh's lemma

Using the known method of finding the min. quadratic form, we obtain (4)

$$\min \sum_{v_1<z^0} \frac{\rho_{v_1}}{v_1} \sum_{v_2<z^0} \frac{\rho_{v_2}}{v_2} = \frac{1}{\sum\limits_{\substack{v_1<z,\\ (v_1,\,nr)=1\\ n^a>p|v_1>x_0}} \frac{\mu^2(v_1)}{\varphi(v_1)}} \cdot \frac{1}{\sum\limits_{\substack{v_2<z,\\ (v_2,\,nd)=1,\\ n^b>p|v_2>x_0}} \frac{\mu^2(v_2)}{\varphi(v_2)}} <$$

$$< c \cdot \prod_{\substack{x_0<p<\min(z,\,n^a)\\ (p,\,nr)=1}} \left(1-\frac{1}{p}\right) \cdot \prod_{\substack{x_0<p<\min(z,\,n^b)\\ (p,\,nd)=1}} \left(1-\frac{1}{p}\right) <$$

$$< c \cdot \left\{ \prod_{x_0<p<z} \left(1-\frac{1}{p}\right) + \prod_{x_0<p<n^a} \left(1-\frac{1}{p}\right) \right\}^2 \cdot \prod_{p|nr} \left(1-\frac{1}{p}\right) \cdot \prod_{p|nd} \left(1-\frac{1}{p}\right) <$$

$$< c \cdot \left(\frac{1}{\ln^2 z} + \frac{1}{(a \ln n)^2} \right) \cdot \ln \ln^2 n \cdot \ln^2 x_0. \qquad (4)$$

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Generalization of Erdesh's lemma

Let us consider the second sum in (3). We note that

$$\lambda_\nu = \mu(\nu) \cdot \frac{\varphi(\nu)}{\varphi_1(\nu)} \cdot \frac{1}{\sum_{r \leqslant z} \frac{\mu^2(r)}{\varphi(r)}} \cdot \sum_{\substack{r \leqslant \frac{z}{\nu} \\ (r,\nu)=1}} \frac{\mu^2(r)}{\varphi(r)}$$

and consequently, $|\lambda_\nu| \leqslant 1$. For p_ν, we have

$$|p_\nu| \leqslant \left| \sum_{\nu = \frac{\nu_1 \cdot \nu_2}{k}} \lambda_{\nu_1} \cdot \lambda_{\nu_2} \right| \leqslant \sum_{\nu = \frac{\nu_1 \cdot \nu_2}{k}} 1 \leqslant \tau^2(\nu).$$ Hence we obtain (5)

$$\sum_{k > x_0} \frac{1}{k^2} \sum_{\nu_1' < \frac{z}{k}} \sum_{\nu_2' < \frac{z}{k}} \frac{|\rho_{\nu_1' \cdot k}|}{\nu_1} \cdot \frac{|\rho_{\nu_2' \cdot k}|}{\nu_2} < c \ln^6 z \cdot \sum_{k=x_0}^{\infty} \frac{\tau^4(k)}{k^2} < c \frac{\ln^6 z \cdot \ln^{15} x_0}{x_0}. \quad (5)$$

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Generalization of Erdesh's lemma

and in addition (6)

$$\sum_{\nu_1 \leq z^2 \; \nu_2 \leq z_2} /p_{\nu_1}/ \, /p_{\nu_2}/ \leq c \cdot z^4 \cdot \ln^6 z. \qquad (6)$$

Substituting (3) and (5) into (4), (6) and (4) into (2) we get (7)

$$S \leq c \cdot \frac{n}{r \cdot d} \left(\frac{1}{\ln^2 z} + \frac{1}{(\alpha \cdot \ln n)^2}\right) \cdot \ln \ln^2 n \cdot \ln^2 x_o + c \cdot \frac{n}{r \cdot \alpha} \cdot \frac{\ln^8 z \cdot \ln^{15} x_o}{x_o} +$$

$$+ c \cdot z^4 \cdot \ln^6 z. \qquad (7)$$

Assuming $z = \sqrt[4]{\frac{n}{rd}} \cdot \frac{1}{\ln^2 \frac{n}{rd}}$, $x_o = (\ln \frac{n}{rd})^{11}$ and substituting

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Generalization of Erdesh's lemma

into (7) we obtain the final estimation

$$S < c \cdot \frac{n}{r \cdot d} \left(\frac{1}{\ln^2 \frac{n}{rd}} + \frac{1}{(\alpha \cdot \ln n)^2} \right) \cdot \ln \ln^2 n \cdot \ln\ln^2 \frac{n}{rd}.$$

[Abstractor's note: This is almost a complete translation]

Card 7/7

VINOGRADOV, A.I.

Mertens formula. Dokl. AN SSSR 143 no.5:1020-1021 Ap '62.
(MIRA 15:4)

1. Leningradskoye otdeleniye Matematicheskogo instituta im. V.A.Steklova AN SSSR. predstavleno akademikom I.M.Vinogradovym.
(Euler's numbers) (Functions zeta)

GEL'FOND, Aleksandr Osipovich;LINNIK, Yuriy Vladimirovich. Prinimali uchastiye:VINOGRADOV, A.I.; MANIN, Yu.I.; KARATSUBA, A.A., red.; AKSEL'ROD, I.Sh., tekhn. red.

[Elementary methods in the analytical theory of numbers]Elementarnye metody v analiticheskoi teorii chisel. Moskva, Fizmatgiz, 1962. 269 p. (MIRA 16:3)
(Numbers, Theory of)

VINOGRADOV, A. I.

Double sums connected with zeroes of Dirichlet's L-series.
Vest. LGU 18 no.1:59-63 '63. (MIRA 16:1)

(Series, Dirichlet's)

VINOGRADOV, A.I.

On the remainder in Mertens's formula. Dokl. AN SSSR 148 no.2: 262-263 Ja '63. (MIRA 16:2)

1. Leningradskoye otdeleniye Matematicheskogo instituta im. V.A. Steklova AN SSSR. Predstavleno akademikom I.M. Vinogradovym.
(Calculus)

ACC NR: AP7007065 SOURCE CODE: UR/0020/66/168/002/0259/0261

AUTHOR: Vinogradov, A. I.; Linnik, Yu. V. (Academician)

ORG: Leningrad Branch, Mathematics Institute im. V. A. Steklov, AN SSSR (Leningradskoye otdeleniye Matematicheskogo instituta AN SSSR)

TITLE: Hyperelliptic curves and the least simple quadrate residue

SOURCE: AN SSSR. Doklady, v. 168, no. 2, 1966, 259-261

TOPIC TAGS: Dirichlet problem, Riemannian geometry

ABSTRACT: Weil's proof of Riemann's hypothesis on the zeta-function and L-function curves over a finite field has been applied by Burgess to Dirichlet's analytical theory of characteristics. Applying the Riemann hypothesis to hyperelliptic curves over a simple finite field, Burgess obtained a new evaluation for the least quadratic nonresidue which greatly advances the "first Vinogradov hypothesis" on the least square nonresidue.

In this paper the Burgess evaluation is joined with the well-known Ziegel theorem on quadratic fields, and an advance is made with respect to Vinogradov's second hypothesis on the least simple quadratic residue.

Vinogradov's second hypothesis states that the least simple quadratic

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ACC NR: AP7007065

residue with respect to a simple modulus D is the least simple number $p = P_{min}(D)$ for which $\chi(p) = 1$ and has the value $P_{min}(D) = O(D^{\varepsilon})$ for $D \to \infty$ and any $\varepsilon > 0$.

Two theorems are given: 1) the least simple quadratic residue with respect to the simple modulus D has the value $P_{min}(D) = O(D^{1/4+\varepsilon})$ for any $\varepsilon > 0$, and 2) for any x under the condition $|D|^{1/4+\varepsilon} \leq x \leq |D|^{1/2}$, the following relation holds:

$$\sum_{n \leq x} a_n = xL(1, \chi)[1 + O(x^{-\gamma})].$$

The latter theorem can be applied to the theory of ternary quadratic forms and the ergodic theory of algebraic fields. Orig. art. has: 7 formulas. [JPRS: 38,417]

SUB CODE:. 12

Card 2/2

VINOGRADOV, A.I., doktor tekhn.nauk, prof. (Khar'kov)

Study of the function of costs in the design of optimum systems.
Issl. po teor. sooruzh. no.14:143-154 '65.
(MIRA 18:10)

VINOGRADOV, A.I.

Nature of symmetry of sums with Dirichlet characters. Izv. AN Uz. SSR. Ser. fiz.-mat. nauk 9 no.1:21-27 '65. (MIRA 18:6)

1. Matematicheskiy institut AN SSSR.

VINOGRADOV, A.I.

Extendability into the left half-plane of the scalar product of Hekke's L-series with characters of magnitude. Izv. AN SSSR. Ser. mat. 29 no.2:485-492 '65. (MIRA 18:5)

1. Leningradskoye otdeleniye Matematicheskogo instituta AN SSSR.

VINOGRADOV, A.I. (Khar'kov)

Optimal distribution of stresses in rod systems and the properties of optimal systems. Prikl. mekh. 1 no.1:86-91 '65. (MIRA 18:5)

1. Khar'kovskiy transportnyy institut.

VINOGRADOV, A.I. (Khar'kov)

"On the optimum distribution of forces in barsystems and on the properties of optimum systems"

report presented at the 2nd All-Union Congress on Theoretical and Applied Mechanics, Moscow, 29 January - 5 February 1964

VINOGRADOV, A.I.

Siegel's zeros. Dokl. AN SSSR 151 no.3:479-481 Jl '63.
(MIRA 16:9)

1. Leningradskoye otdeleniye Matematicheskogo instituta im. V.A.Steklova AN SSSR. Predstavleno akademikom I.M.Vinogradovym.
(Fields, Algebraic) (Functions, Zeta)

VINOGRADOV, A.I., professor, doktor tekhnicheskikh nauk (Khar'kov)

Some problems in calculating rod systems with fixed tensions. Issledovaniia po teorii sooruzhenii. Sbornik statei no.6:357-379 '54. (MLRA 7:11)
(Structures, Theory of) (Strains and stresses) (Elastic plates and shells)

VINOGRADOV, A.I., professor, doktor tekhnicheskikh nauk (Khar'kov)

Statically indeterminate rod systems of small dimensions. Issledovaniia po teorii sooruzhenii. Sbornik statei no.6:381-387 '54. (MLRA 7:11)
(Structures, Theory of) (Strains and stresses) (Elastic plates and shells)

SOV/124-57-8-9502

Translation from: Referativnyy zhurnal. Mekhanika, 1957, Nr 8, p 133 (USSR)

AUTHOR: Vinogradov, A. I. Dr. Tech. Sci., Prof.

TITLE: Aspects of the Analysis of Least-weight Structures (Voprosy rascheta sooruzheniy naimen'shego vesa)

PERIODICAL: Tr. Khar'kovsk. in-ta inzh. zh.-d. transp., 1955, Nr 25, 175 pp, ill.

ABSTRACT: This entire issue is devoted to developing a method of prescribed stresses for statically indeterminate variable-section beams, frames, and arches. The calculation problem is examined for a single loading and for a variety of different multiple loadings, relative to which it is stipulated that they may act conjointly in any imaginable combination. Some of the investigation results had already appeared in papers published previously by the author (RZhMekh, 1955, abstracts 3921 and 3922). The author introduces into his calculation procedure change-of-sign functions, this being one possible device for assuring that he will come out with essentially positive values for the moments of inertia and cross-sectional areas. In the first section a method for determining the change-of-sign function is set forth; an account is given of the various influences to which a function of this type is

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subject, and the properties of the function are investigated. In the second section the author discusses the concept whereby a plurality of different types of structure may have an indentical axial-line pattern. Strain continuity equations for statically indeterminate beams are evolved in a form characteristic of the method of stresses, and a symbolic way of writing them is tentatively proposed. An examination is made of the conditions of the tractability of these equations. Examples are given of their solution in the case of beams of uniform strength and of frames, examples wherein the normal forces are not taken into account. The author examines the problem of the least-weight system and evolves corresponding equations for the least volume in the case of flexure. He establishes the conditions wherein these equations will coincide with the strain-continuity equations. In the third section, strain-continuity equations are evolved for the case of simultaneous flexural and compressive stresses in a form characteristic of the method of stresses; it is pointed out that these equations are difficult of solution. For the case of flexure the problem is analyzed as to: 1) Whether there exists any solution at all, and 2) whether there exists only one solution or more than one, depending on the ratio of the number of points at which the bending moment changes sign to the given number of redundant connections. Next, adopting certain premises, the author analyzes the case wherein flexural and compressive stresses operate simultaneously. The well-known thesis with regard to

Aspects of the Analysis of Least-weight Structures

statically indeterminate trusses, to the effect that the maximum possible internal stresses (i.e., the limits of that range within which the redundant unknowns and all the stresses exist) are statically determinate, is proved valid for systems subjected to flexural stresses. Examining on page 56 the double-pin-jointed beam clamped at both ends, the author asserts that, if the relative angles of beam rotation at the pin joints equal zero, i.e., if the beam's line of flexure is an unbroken line, then the beam constitutes a statically indeterminate system. Earlier, however, on page 28, he regards a similar beam as constituting a system lying somewhere between a statically determinate and statically indeterminate system. It is the author's opinion that a beam may be characterized by an absolute uniformity of strength and yet, at the same time, be statically indeterminate and retain its initial number of redundant connections. In the fourth section, least-volume equations are evolved for the case wherein flexural and compressive stresses operate simultaneously. By way of example, these equations are solved for the case of a fixed arch, it being shown that acceptable solutions are possible only when the number of points at which the bending moment changes sign is not exceeded by the number of given redundant connections. Next, least-volume equations are evolved for a case wherein calculations are to be made for multiple loadings with loads of different types, the stresses anticipated again being simultaneous flexural and compressive ones. These equations and

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certain other formulae are evolved on the basis of design combinations of loads worked out in terms of the axial bending moments, a procedure which, as the author points out, is permissible in cases in which loads produce mainly flexural stresses in structures. However, these very equations and formulae are subsequently extended to arches whose axial lines conform to the curve of the pressure exerted by the full dead load on the arch plus one-half the live load at all values of the dead-load/live-load ratio, in other words, to arches where the stresses arising are mainly compressive. A determination is made of the most advantageous influence lines. Representing the volume of a beam subjected to a dead load as a function of a redundant unknown, the author shows by an example that the curve representing this function has a minimum in a single point only. An analogous property is demonstrated for the general case. An investigation is made of the properties of least-weight systems designed either for a single loading or for multiple loadings. In the fifth section, methods are evolved for solving the least-volume equations in the case of statically indeterminate symmetrical beams and arches. As an example, the author solves the least-volume problem for the case of a uniform-strength two-hinged arch whose axis follows the curve of the pressure exerted by the full dead load upon the arch plus half the live load. In the sixth section the use of the least-volume equations to calculate uniform-strength arches is

Aspects of the Analysis of Least-weight Structures

described in detail and is illustrated with the example of a fixed arch whose axis conforms to the curve of the pressure exerted by the full dead load upon the arch plus half the live load. The theoretical volume of the most efficient nonuniform-strength arch, as calculated by the usual method, proved to be 18-22% greater than the theoretical volume of the corresponding uniform-strength arch. In the seventh and final section there are tables to facilitate the selection of suitable arch cross sections; proper use of these tables is demonstrated by an example wherein suitable cross sections are selected for a uniform-strength reinforced-concrete arch. Under certain tentative premises the volume of a nonuniform-strength arch as calculated by the usual method turned out to be 12% greater than that of the corresponding uniform-strength arch.

K. M. Khuberyan

VINOGRADOV, A.I., doktor tekhnicheskikh nauk, professor.

Determining elastic-plastic displacement in rod systems. Trudy KHIIT no.26:5-38 '56. (MLRA 9:12)
(Elastic rods and wires)

VINOGRADOV, A.I., doktor tekhn. nauk, prof. (Khar'kov)

Characteristics of structures with a fixed given axis configuration.
Issl. po teor. sooruzh. no.7:365-371 '57. (MLRA 10:9)
(Girders)

VINOGRADOV, A.I., doktor tekhn. nauk, prof. (Khar'kov).

Designing structures having closed contours and with predetermined stresses. Issl. po teor. sooruzh. no.7:373-400 '57. (MLRA 10:9)
(Graphic statics) (Structures, Theory of)

VINOGRADOV, A.I. [Vynohradov, O.I.]; VASIL'YEV, V.G. [Vasyl'iev, V.H.] (Kharkiv)

Determining the displacements in bar systems of box-type and I-cross sections beyond the elastic limit.[in Ukrainian with summaries in Russian and English]. Prykl. mekh. 3 no.4:409-419 '57. (MIRA 11:2)

1.Kharkivs'kiy institut inzheneriv zaliznichnogo transportu.
(Girders)

81543

SOV/137-59-5-11407

18.7100

Translation from: Referativnyy zhurnal, Metallurgiya, 1959, Nr 5, p 275 (USSR)

AUTHORS: Gol'dshteyn, B.G., Vinogradov, A.I.

TITLE: Quench-Hardening of Carbon-Steel Instruments in Molten Salts

PERIODICAL: Yaroslavsk. prom-st' (Sovnarkhoz Yaroslavsk. ekon. adm. r-na), 1958, Nr 6, pp 15 - 18

ABSTRACT: Information is given on experience made at the "Krasnyy mayak" plant in using stepwise quench hardening of instruments made of U8, U10, 45-50 or carburized steel in a salt bath of the following composition (in %): 53 KNO_3, 40 $NaNO_2$, 7 NaNO, with addition of 2 - 3.5% water. The low operational temperature of the salt bath (110° - 125°C), vigorous stirring with an impeller, and the presence of water raise considerably the cooling rate in comparison to a salt bath having a temperature of 150° - 160°C, and ensure R_C 62 - 64 in quench-hardening U8 and U10 steel instruments of up to 60 - 100 mm in diameter or thickness. The salt bath with a salt weight of 120 - 150 kg is filled up with ~ 2 l/day of water in two shift operations. To raise hardenability of in-

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Quench-Hardening of Carbon-Steel Instruments in Molten Salts

struments of large cross-sections it is recommended to raise the hardening temperature to 820° - 840°C. Impaired mechanical properties caused by coarsening of the grains are compensated by reduced internal stresses and a higher amount of residual austenite. Compared to water quenching and quench-hardening in salt and alkali solutions, the method is simple and does not require sealing of holes in the instruments. It eliminates rejects caused by cracks and warping. Extended holding in the salt bath over 1 - 5 minutes has only a slight influence on the structure and hardness of steel.

L.F.

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18.7100
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Translation from: Referativnyy zhurnal. Mashinostroyeniye, 1959, Nr 12, p 108 (USSR)

AUTHORS: Gol'dshteyn, B.G., Vinogradov, A.I.

TITLE: The Hardening of Carbon Steel Tools in Molten Salts

PERIODICAL: Yaroslavsk. prom-st' (Sovnarkhoz Yaroslavsk. ekon. adm. r-na), 1958, Nr 6, pp 15-18; Stroit. i dor. mashinostr., 1958, Nr 11, pp 34-36

ABSTRACT: In order to reduce residual stresses and to obtain high mechanical properties in tools of carbon steel, it is recommended to apply a staggered cycle of treatment with cooling in molten salts at 110 - 125°C, soaking for 1 - 5 minutes and cooling in the air. The composition of the mixture is: 53% KNO_3, 40% $NaNO_2$, 7% $NaNO_3$ with an addition of 2 - 3.5% of water; the melting point is 100°C. Provided that intensive agitation is taking place, a hardness of R_C 60 is obtained for tools of carbon steel with a thickness up to 60 - 80 mm. If the machine parts to be hardened, made of U8 and U10 grade steel, are vigorously moved, a hardness of R_C 62 - 64 can be obtained. Staggered hardening, owing to a decrease in residual stresses, ensures a minimum of deformation of the tool and practically completely eliminates the risk of hardening cracks. Since cooling in molten salts at

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a temperature of 110 - 125°C reduces the thickness of the hardened layer. compared with cooling in water, it is expedient to increase the heating temperature of hardening up to 820 - 840°C. A decrease in deformation of tools of complicated shape can be obtained by subjecting the blanks to intermediate heat treatment. Staggered heat treatment can be efficiently employed for the hardening of cemented machine parts from low carbon steel up to 80 mm in thickness, as well as of big-sized machine parts from 65G, 40Kh, ShKh6 and other steel grades, if hardening in oil does not ensure high hardness. 1 figure.

B.V.N.

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VINOGRADOV, A.I., doktor tekhn.nauk, prof.

Efficient design and efficient form of hingeless arches. Trudy KHIIT no.28:82-125 '58. (MIRA 12:3)
(Arches)

VINOGRADOV, A.I., doktor tekhn.nauk, prof.

Designing statically indeterminate trusses. Trudy KHIIT no.28:126-143 '58. (MIRA 12:3)
(Trusses)

VINOGRADOV, A.I., doktor tekhn. nauk, prof. (Khar'kov)

Designing rod systems of minimal weight. Issl. po teor. sooruzh. no.8:499-521 '59. (MIRA 12:12)
(Elastic rods and wires)

VINOGRADOV, A.I., doktor tekhn. nauk prof. (Khar'kov)

Taking into account the natural weight of rod systems with given stresses. Issl. po teor. sooruzh. no.8:523-534 '59.
(MIRA 12:12)

(Structural frames)

VINOGRADOV, A.I. (Khar'kov)

Most efficient elimination of excessive trusses in frames with given stresses. Stroi.mekh.i rasch.soor. 1 no.5:7-13 '59. (MIRA 13:1)
(Structural frames)

VINOGRADOV, A.I.; RAKIVNENKO, N.S.

"Studies in the theory of structures" by A.A.Gvozdev and others. Reviewed by A.I.Vinogradov, N.S.Rakivnenko. Stroi. mekh.i rasch.soor. 2 no.3:51-52 '60. (MIRA 13:6)
(Structures, Theory of) (Gvozdev, A.A.)

VINOGRADOV, A.I. [Vynohradov, O.I.] (Khar'kov); FESIK, S.P. [Fesyk, S.P.] (Khar'kov)

Optimum stress distribution in combined systems. Prykl.mekh. 7 no.2: 157-163 '61. (MIRA 14:4)

1. Khar'kovskiy institut inzhenerov zheleznodorozhnogo transporta.
(Strains and stresses)

VINOGRADOV, A.I.; FESIK, S.P. (Khar'kov)

Statically indeterminate frames with the least weight. Stroi. mekh. i rasch. scor. 4 no.3:11-14 '62. (MIRA 15:6)
(Structural frames)

VINOGRADOV, A.I.

Automating the asynchronous drive of skip hoisting equipment during deceleration and drawing-up periods with the use of a low-frequency current. Izv. vys. ucheb. zav.; tsvet. met. 8 no.1:152-158 '65. (MIRA 18:6)

1. Kommunarskiy gornometallurgicheskiy institut, kafedra gornoy elektromekhaniki.

VINOGRADOV, A.I.

Quasi-Riemannian and density hypotheses. Dokl. AN SSSR 158 no.5:1014-1017 O '64. (MIRA 17:10)

1. Leningradskoye otdeleniye Matematicheskogo instituta im. V.A.Steklova AN SSSR. Predstavleno akademikom I.M.Vinogradovym.

VINOGRADOV, A.I.

Lower limits in algebraic number fields using the sieve method.
Dokl. AN SSSR 154 no.1:13-15 Ja'64. (MIRA 17:2)

1. Leningradskoye otdeleniye Matematicheskogo instituta im.
V.A. Steklova AN SSSR. Predstavleno akademikom I.M. Vinogradovym.

VINOGRADOV, A.I., prof., doktor tekhn.nauk; ANDRI'EVSKIY, V.G., assistent

"Energy theory of the strength of visco-elastic materials." Nauch. trudy KHIIT no.58:109-120 '62. (MIRA 16:12)

L 18462-63 EPF(c)/EWP(j)/EWT(.)/BDS/ES(v) AFFTC/ASD Pc-4/Pr-4/
Pc-4 RM/WW/MAY 3/0124/63/000/003/V079/V079
ACCESSION NR: AR3006451

SOURCE: RZh. Mekhanika, Abs. 8V665

72

AUTHOR: Vinogradov, A. I.; Andriyevskiy, V. G.

TITLE: On energetic theory of durability of a viscoelastic material

CITED SOURCE: Nauchn. tr. Khar'kovsk. in-t inzh. zh.-d. transp., vy*p. 58, 1962, 109-120

TOPIC TAGS: viscoelastic, viscoelasticity, high polymer, durability, energetic theory, energy conservation, Kapron, heat capacity, torsion

TRANSLATION: This paper proposes and experimentally verifies the premises for the approximate theory of strain and breakdown of viscoelastic media as applied to high polymers and in particular to Kapron. Attention is focussed on the case of vibratory loads which are characterized by the necessity of considering in the general case the energy of thermal exchange and the energy of increase of the heat capacity. The fundamental equation of energy dissipation for viscoelastic media based on the law of conservation of energy is described in the following form: $U = U_T + U_S + U_k$ where in unit time at the point being considered during a given

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time interval: U is the energy dissipation of the dissipative process, U_T is the energy of thermal exchange with the surrounding medium, U_S is the increase of the heat capacity (during the increase of temperature), U_K is the energy dissipated in connection with the variation of the structure and physical properties of the material. The authors distinguish the special case of the deformation process with a vibrated load, separating the relative value of the components of the total scattered energy of the dissipative process. In all cases one may consider both stable and unstable systems of deformation. Consideration is made of definite energy of the dissipative process for linear stressed states of various models of elastically connected media: 1) elastically connected elements with parallel coupling of elastic and viscous components; 2) a model in which the elastic and viscous elements are joined or in series; 3) a model of a viscoelastic element with four parameters. Experimental studies were conducted on samples of second order Kapron. The sample was worked, as a cantilever arm loaded at the end by a force. The test cycle was symmetric. The experiments were conducted at a temperature of 20 ± 2° and at relative humidity of 40-50%. An apparatus was introduced on which the magnitude of the sag, the temperature of the sample and the torsional moment were measured and recorded on a self-recording galvanometer tape. The separation into the three special cases of the process of testing with a vibratory load was experimentally verified: 1) for sufficiently small loads on the sample (up to 250

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grams), 2) for higher loads (350-700 grams), and 3) for very high loads (greater than 700 grams). Examination was made of the characteristic peculiarities of each of these cases. Case 2) was considered more carefully, as it represents the case of greatest interest, since in use the material breaks down under analogous conditions. Thus the basic assumptions of the energetic theory of the durability of polymers with the use of the four element model of viscoelastic media is experimentally corroborated. Bibl. 7 names. N. V. Russkov

DATE ACQ: 28Aug63 SUB CODE: MA, AP ENCL: 00

Card 3/3

VINOGRADOV, A.I.

Hua Lo-k'êng's problem. Dokl. AN SSSR 151 no.2:255-257 Jl '63.
(MIRA 16:7)

1. Leningradskoye otdeleniye Matematicheskogo instituta im. V.A. Steklova AN SSSR. Predstavleno akademikom I.M.Vinogradovym.
(Numbers, Theory of)

VINOGRADOV, A.I.

On the number of classes of ideals and the group of classes of divisors. Izv. AN SSSR Ser. mat. 27 no.3:561-576 My-Je '63. (MIRA 16:6)

(Ideals(Algebra))

ZHUNEV, A.G.; SAVEL'YEV, B.A.; KOLESANOV, F.F.; VINOGRADOV, A.I.; YUFEROV, A.I.; VEDERNIKOV, N.P.; SERIN, P.A.; VEDERNIKOVA, L.N.

Preparation of Bakal siderites for blast furnace smelting by means of roasting. [Sbor. trud.] Nauch.-issl.inst.met. no.4:33-43 '61. (MIRA 15:11)

(Bakal region--Siderite)
(Ore dressing)

VINOGRADOV, A.I., prof., doktor tekhn.nauk; ANDRIYEVSKIY, V.G., assistent

Model of an elastic-viscous medium and its application for the specification of the mechanical characteristics of secondary capron. Trudy KHIIT no.45:100-121 '61. (MIRA 15:5)
(Elasticity--Models) (Nylon)

L 01473-66 EWT(m)/EWP(f)/T-2

(A)

ACCESSION NR: AR5019472 UR/0273/65/000/007/0012/0012
621.43-533.65

SOURCE: Ref. zh. Dvigateli vnutrennego sgoraniya. Otdel'nyy vypusk, Abs. 7.39.99

AUTHOR: Vinogradov, A. L.

TITLE: Temperature control in tractor and automotive engines

CITED SOURCE: Tr. Tsentr. n.-i. in-ta mekhaniz. i elektrifik. s. kh. nechernozemn. zony SSSR, v. 2, 1964, 143-155

TOPIC TAGS: internal combustion engine, automatic temperature control, engine cooling system, automatic control system

TRANSLATION: The operating temperature of an internal combustion engine affects its life and efficiency. Engine life can be doubled by limiting temperature fluctuations to ± 5C. Automatic control systems for engine temperature should satisfy the following conditions: 1) Adequate control accuracy. Cooling liquid temperature fluctuations should not exceed ± 5C from the design specification. 2) The system should be simple and reliable. 3) Energy consumption should be low. 4) Installation of the system should not involve an increase in the energy lost for cooling. 5) Effects of the system on the overall design of

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ACCESSION NR: AR5019472

the engine should be minor. Two systems, one louvered and the other with a ferromagnetic powder sleeve, provide best compliance with cited requirements and are described.

SUB CODE: PR, IE ENCL: 00

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VINOGRADOV, A.L.

Automatic synchronous drive of a mine skip, controlled by means of a liquid rheostat. Izv. Sib. otd. AN SSSR no.9:23-30 '59 (MIRA 13:3)

1. Sibirskiy metallurgicheskiy institut, g. Stalinsk.
(Mine hoisting--Electric driving)

SOV/124-57-3-3494

Translation from: Referativnyy zhurnal. Mekhanika, 1957, Nr 3, p 125 (USSR)

AUTHOR: Vinogradov, A. I.

TITLE: On the Determination of Elastic-plastic Displacements of Rod Systems (Ob opredelenii uprugo-plasticheskikh peremeshcheniy v sterzhnevykh sistemakh)

PERIODICAL: Tr. Khar'kovsk. in-ta inzh. zh.-d. transp., 1956, Nr 26, pp 5-38

ABSTRACT: Displacements occurring beyond the elastic limit are determined for systems consisting of rectangular rods. The hypothesis of plane sections is adopted. The effect of shearing stresses is not taken into consideration. The author studies three stages of the state of stress of a cross section (the appearance of one zone of yield, the presence of two zones of yield, and the extension of yield through the entire cross section). The curves of normal stresses resulting from the action of a moment and a normal force are reduced to nominal elastic curves for which the strength-of-material formulas hold true. Mohr's formula is used for the determination of the displacements and the following two coefficients allowing for the development of plastic deformations are

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On the Determination of Elastic-plastic Displacements of Rod Systems

introduced: K_1, a coefficient of moment-of-inertia reduction, and K_2, a coefficient of cross-sectional constriction. In this way, the determination of the displacements is conducted in accordance with the actual stresses but within the system of reduced cross sections. For the sake of convenience in calculation, the proposed formulas are expressed in terms of the quantities ϕ and ν which depend upon the shape of the curve representing the moments of the different cross sections of the shaft, depending on whether they are working in the first or the second elastic-plastic stages, respectively. A number of tables are presented for the calculation of the displacements as well as numerical samples for the determination of the displacements in rod systems beyond the elastic limit. Bibliography: 12 references.

A. I. Strel'bitskaya

VINOGRADOV, A.I.

Evaluation of binary problems. Vest.LGU 14 no.7:26-31 '59.
(MIRA 12:5)

(Numbers, Theory of)

VINOGRADOV, A.I. [Vynohradov, O.I.]

Minimum weight of trusses. Prykl.mekh. 4 no.3:241-249 '58.
(MIRA 13:8)

1. Khar'kovskiy institut inzhenerov zheleznodorozhnogo transporta.
(Trusses)

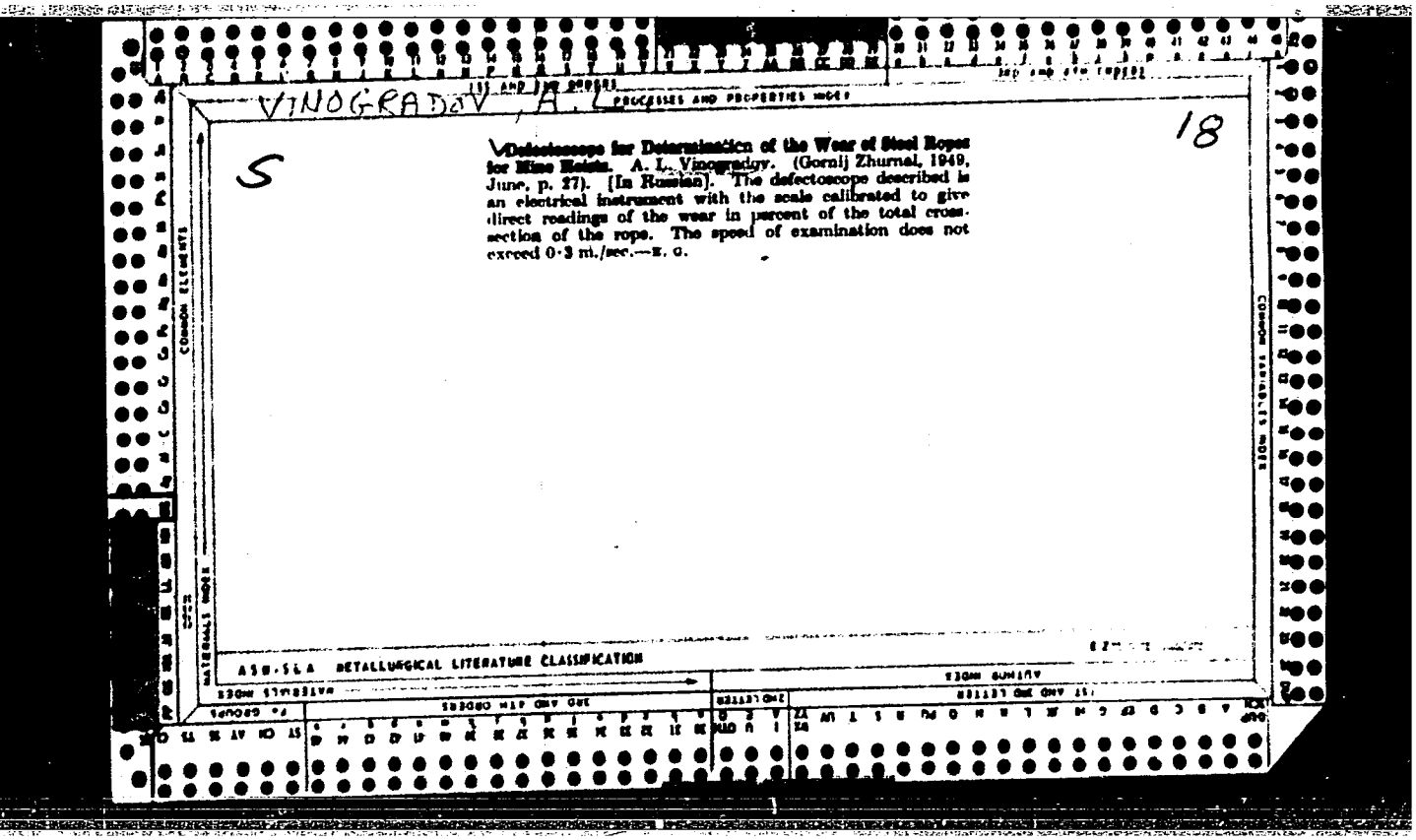
VINOGRADOV, A.I. (Khar'kov)

Miniumum-weight systems with yielding elastic joints. Stroi.mekh. i rasch. soor. 2 no.5:1-6 '60. (MIRA 13:9)
(Girders)

VINOGRADOV, A. I.

Generalization of the Erdös lemma. Vest. LGU 15 no.19-124-126 '60.
(MIRA 13:9)
(Equations)

VINOGRADOV, A. K., CAND AGR SCI, "EFFECT OF ~~PLANTING TIME~~ duration of sowing AND ~~THE SEEDING RATES~~ rates of sowing OF FLAX SEED ~~ON~~ upon THE YIELD AND QUALITY OF THE FIBER AND SEEDS." LENINGRAD, 1961. (MIN OF AGR RSFSR. LENINGRAD AGR INST). (KL-DV, 11-61, 225).



VINOGRADOV, A. L.

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Defectoscope for Determination of the Wear of Steel Ropes for Mine Hoists. A. L. Vinogradov. (Gornij Zhurnal, 1949, June, p. 27). [In Russian]. The defectoscope described is an electrical instrument with the scale calibrated to give direct readings of the wear in percent of the total cross-section of the rope. The speed of examination does not exceed 0·3 m./sec.—E. G.

VINOGRADOV, A.L., kand.tekhn.nauk, dotsent; STAKHANOV, V.A., inzh.

Electronic time relay with a voltage multiplier in the electrical system of an automatic skip hoist. Izv. vys. ucheb. zav.; energ. 6 no.4:110-115 Ap '63. (MIRA 16:5)

1. Kommunarskiy gornometallurgicheskiy institut. Predstavlena elektromekhanicheskoy sektsiyey nauchno-tekhnicheskoy konferentsii.
(Hoisting machinery) (Electric relays)

VINOGRADOV, Aleksandr Leonidovich, kand.tekhn.nauk, dotsent

Use of a forcing system in the automatic control of a skip hoist in the dragging-up process. Izv.vys.ucheb.zav.; elektromekh. 5 no.9:1048-1052 '62. (MIRA 16:1)

1. Zaveduyushchiy kafedroy gornoy elektromekhaniki Kommunarskogo gornometallurgicheskogo instituta.
(Electric driving)
(Hoisting machinery--Electric driving)

OBUZENKO, Tat'yana Anatol'yevna, kand.tekhn.nauk, starshiy prepodavatel';
VINOGRADOV, Andrey Leonidovich, kand.tekhn.nauk, dotsent

Use of powder metal clutches to regulate the speed of electric drives. Izv. vys. ucheb. zav.; elektromekh. 3 no.12:72-79 '60.
(MIRA 14:5)

1. Kafedra elektricheskikh mashin Leningradskogo instituta tochnoy mekhaniki i optiki.

(Electric driving)
(Clutches (Machinery))

VINOGRADOV, A.L., dotsent

Investigating the stability of one of the diagrams of an automatic asynchronous motor for skip hoisting equipment controlled by means of an electrolytic rheostat. Izv. vys. ucheb. zav.; gor. zhur. no.10:169-176 '60. (MIRA 13:11)

1. Sibirskiy metallurgicheskiy institut. Rekomendovana Sovetom gornogo fakul'teta Sibirskogo metallurgicheskogo instituta.
(Hoisting machinery--Electric driving)
(Electric rheostats)

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AUTHORS: Glazenko, T. A., Candidate of Technical Sciences, Senior Instructor and Vinogradov, A. L., Candidate of Technical Sciences, Docent

TITLE: Speed Control of Electric Drives with Powder Couplings

PERIODICAL: Izvestiya vysshikh uchebnykh zavedeniy, Elektromekhanika, 1960, No. 12, pp. 72-79

TEXT: Magnetic-powder couplings are now widely used in electrical drives. As the torque of a powder coupling does not depend on the relative speeds of the operating surfaces, the couplings cannot be used for controlling the speed of mechanisms with open control systems. For stable speed control it is necessary to introduce firm negative feed back according to the speed of the output shaft. Losses in the coupling are then proportional to the degree of speed control. Simple expressions are given for the power loss in the coupling and the speed of the output shaft. When speed control with reversing is required, two powder couplings may be used. In such systems additional

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difficulties arise because of the need to separate the signal and direct it to the field winding of the appropriate coupling. Control circuits may be classified according to the kind of signal and type of amplifier. The control voltage may be applied over a three-wire circuit, using the yes-no principle, or over a two-wire circuit, using variable sign. The first method is not recommended because with any type of amplifier there is a slight retardation when the signal is removed. When the control is by voltage of variable sign, two methods of separating the signal are possible: the signal may be separated after amplification, using a balancing amplifier whose output voltage polarity depends on change in the sign of signal; or alternatively the signal may be separated before amplification, using two amplifiers. The first of these methods has the advantage that there is no amplifier output current during quiescence, so that coupling design is simplified; but as the amplifier is of low efficiency it cannot be used at appreciable outputs and the action is not very rapid. With the second method the amplifier efficiency is

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high and the system as a whole operates more quickly. However, a no-load current flows through the coupling winds during quiescence. This increases the no-load losses of the drive or necessitates an additional demagnetizing winding on the coupling with a third slip-ring. The circuit of a reversing electric drive with powder couplings for a wide range of speed control is then considered. The motor was of 75 W and the maximum coupling torque was 20 kg/cm. The input speed was 1500 r.p.m. A sectional drawing of the coupling is shown in Fig. 5. The tacho-generator is connected to the output drive through a step-up gear. The coupling has two gaps; the driving part consists of a hollow vessel with a small moment of inertia. The coupling has two windings connected to three slip-rings; the auxiliary winding of 100 turns equalizes the e.m.f. set up by the amplifier no-load current. An electrical circuit diagram of the equipment with a magnetic amplifier having internal negative feed-back controlled by a signal of alternating sign is shown in Fig. 6. In this circuit the time-constant of the magnetic amplifier is of the order of 0.02 seconds, which improves the speed and stability of

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the system. The use of a circuit with two magnetic amplifiers, shown in Fig. 8 reduces the size and weight of the equipment and increases its speed. This circuit uses magnetic amplifiers with negative feed-back. The control winding circuit contains separating diodes B_1 and B_2 which rectify the even harmonics in the control windings which are induced from the working circuit, which could cause self-excitation of the magnetic amplifiers. To prevent this effect the control winding W_y is shunted with resistance and capacitance. With this circuit very intense retardation can be obtained, reducing the transient process time. The statements about the performance of the two circuits are confirmed by oscillograph records. The output speed is a linear function of the control voltage. The power required to excite the powder couplings is very small and so for small couplings the magnetic amplifiers may be replaced by valve or transistor devices. Simple circuit diagrams are given for these two cases. It is concluded that powder couplings can provide smooth speed control over a wide range (0 to 1400 r.p.m. is mentioned). The

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equipment is small and light, being less than half the weight of the equipment normally used for reversing. There are 12 figures and 5 Soviet references.

ASSOCIATION: Kafedra elektricheskikh mashin Leningradskogo instituta tochnoy mekhaniki i optiki (Department of Electrical Machines, Leningrad Institute of Precision Mechanics and Optics)

SUBMITTED: March 8, 1960

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VINOGRADOV, A.L.

Vsesoyuznoye ob"yedinennoye soveshchaniye po avtomatizatsii proizvodstvennykh protsessov v mashinostroyenii i avtomatizirovannomu elektroprivodu v promyshlennosti. 3d, Moscow, 1959

Elektroprivod i avtomatizatsiya promyshlennykh ustanovok; trudy soveshchaniya (Electric Drive and Automation in Industrial Systems; Transactions of the Conference) Moscow, Gosenergoizdat, 1960. 470 p. 11,000 copies printed.

General Eds.: I.I. Petrov, A.A. Sirotin, and M.G. Chilikin; Eds.: I.I. Sud, and E.P. Bilayev; Tech. Eds.: K.P. Voronin, and G.Ye. Larionov.

PURPOSE: The collection of reports is intended for the scientific and technical personnel of scientific research institutes, plants and schools of higher education.

COVERAGE: The book is a collection of reports submitted by scientific workers at plants, scientific institutes and schools of higher education at the third Joint All-Union Conference on the Automation of Industrial Processes in Machine Building and Automated Electric Drives in Industry held in Moscow on May 12-16, 1959. The Conference was called by the Academy of Sciences USSR, the Gosplan SSSR (State Planning Commission USSR), the GNTK SSSR, the Gosudarstvennyy Komitet po avtomatizatsii i mashinostroyeniyu (State Committee on Automation and Machine Building) and the Natsional'nyy Komitet SSSR po avtomaticheskomu upravleniyu (USSR National Committee on Automatic Controls) and prepared by the Nauchno-tekhnicheskiy komitet po avtomatizirovannomu elektroprivodu (Scientific and Technical Committee on Automated Electric Drives), the MEI (Moscow Institute of Energetics), the VNIIEM, the IAT (Institute of Automation and Telemechanics) of the Academy of Sciences USSR, and the Komissiya po tekhnologii mashinostroyeniya Instituta mashinovedeniya AN SSSR (Commission on the Technology of Machine Building of the Institute of Science of Machines of the Academy of Sciences USSR). It was the purpose of the Editorial Board to arrange the reports in a way which would ensure a relatively systematic presentation of theoretical and practical problems relating to electric drives and automatic controls of industrial mechanisms used in various branches of industry. Basic problems of automated electric drive and their solution are outlined. The book also contains articles on electric machinery and means of automation. Considerable attention is paid to noncontact automatic control systems, including systems with semiconductor devices and magnetic amplifiers, and to computers intended both for the analysis and the synthesis of linear and nonlinear automatic regulation and control systems. Reports already published in journals or official publications have been considerably abbreviated; those which have appeared in volume V of NIX EP transactions or in the journal "Elektrichestvo" are marked with an asterisk. No personalities are mentioned. References accompany some of the papers.

PART I. GENERAL PROBLEMS CONCERNING THE THEORY AND PRACTICE OF ELECTRIC DRIVE AND AUTOMATION OF CONTROL

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VINOGRADOV, A.L., dotsent

Using electronic relays for the automatic control of skip hoisting equipment in the slowing-down process. Izv.vys.ucheb.zav.; gor. zhur. no.8:69-73 '59. (MIRA 13:5)

1. Sibirskiy metallurgicheskiy institut imeni S. Ordzhonikidze. Rekomendovana kafedroy gornoy elektromekhaniki.
(Hoisting machinery) (Automatic control)

VINOGRADOV, A.L., dots.

[redacted] Investigating the slowing down of a skip hoisting arrangement with step (pulse) regulation of the momentum. Izv.vys.ucheb.zav.; gor.zhur. no.5:98-105 '58. (MIRA 12:1)

1. Sibirskiy metallurgicheskiy institut.
(Mine hoisting) (Automatic control)

SOV/112-59-2-3021

Translation from: Referativnyy zhurnal. Elektrotekhnika, 1959, Nr 2, p 111 (USSR)

AUTHOR: Vinogradov, A. L.

TITLE: Calculating the Resistors for an Electrical Speed Limiter (Raschet soprotivleniy elektricheskogo ogranichitelya skorosti)

PERIODICAL: Izv. vyssh. uchebn. zavedeniy. Gornyy zh., 1958, Nr 1, pp 156-158

ABSTRACT: A new type of electrical speed limiter is used in the mining industry for the shaft hoist; one of the major components of the limiter is a rheostat whose resistance is varied as a function of position of hoisting vessels; the rheostat acts as a primary element determining the vessel motion during the deceleration period. Methods are presented for computing resistance of the electrical speed limiter for the case of linear time-deceleration relation. In this case, the speed variation in terms of the vessel travel can be found from the formula $V = V_{maks}\sqrt{1 - \frac{x}{h_z}}$

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where h_z is a section on the depth indicator that corresponds to the total deceleration distance of the vessels in the shaft, x is a section on the depth indicator that corresponds to the distance traveled by the vessels from the moment the deceleration started. A formula is derived that determines the shape of an insulating plate on which the resistance wire of the speed limiter should be wound. Thanks to this plate shape, the limiter cursor can travel along a straight line which simplifies adjustments and operation.

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AUTHOR: Vinogradov, A.M.

TITLE: Adams' Spectral Sequence

PERIODICAL: Doklady Akademii nauk SSSR, 1960, Vol.133, No.5, pp.999-1002.

TEXT: From a more general point of view the author investigates questions connected with the remainder term of the spectral sequence introduced by Adams (Ref.1).
Let X be a space and S be a covering operator. Let

$$\pi_m^S(X) = \operatorname{Dir}\lim_{n\to\infty} [\pi_{m+n}(S^n X)] \; ; \; \pi^S(X) = \sum_{m \geqslant 0} \pi_m^S(X);$$

K_m^S - subgroup of the group $\pi_m^S(X)$ consisting of the elements of the order $q \neq p$, where p is a fixed prime number; $K_m(X)$ - subgroup of the group $\pi_m(X)$ consisting of elements of the order $q \neq p$; $K_\pi^S(X) = \sum_{m \geqslant 0} K_m^S(X)$;

$K_\pi(X) = \sum_{m \geqslant 0} K_m(X)$.

Theorem 1 : Principal theorem of Adams (Ref.1).

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Adams' Spectral Sequence

Lemma: To every space X and every prime number p there exists a space X_p and a mapping $f^p: X \to X_p$ so that coker $f^p_* = 0$, ker $f^p_* = K_*(X)$. The space X_p with these properties is determined uniquely up to the singular homotopic type (i.e. the spaces have the same singular homotopic type if their natural systems are isomorphic).

Definition 1: The space X is called a p-space if it has the same homotopic type as the space X_p.

Lemma 2: Adams sequences with respect to mod p, calculated for X and X_p are isomorphic and this isomorphism is realized by f^p_*.

Definition 2: A p-system of a p-space X is a system of fiberings

$$(1) \qquad X_0 \xleftarrow[g_1]{F_1} X_1 \xleftarrow[g_2]{F_2} X_2 \xleftarrow[g_3]{F_3} \cdots$$

which satisfies the following conditions:

1) The limit space $\overline{X}$ of this system has the same singular homotopic type as X.

2) The spaces X_0 $F_1, F_2, \ldots$ are direct products of spaces of the type

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